

# **Continuous Deflection Separation, Fuzzy Filter and UV Treatment of SSO-Type Wastewaters: Pilot Study Results**

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U.S. Environmental Protection Agency Cooperative Agreement  
No. X-82435210

Awarded to  
Rockland County Sewer District No. 1  
Orangeburg, NY

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Additional Funding Supplied by  
New York State Energy Research and Development Authority Contract No. 4071L-ERTER-NW-96

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E. Timothy Oppelt, Director  
National Risk Management Research Laboratory

## Abstract

This report was submitted in fulfillment of Cooperative Agreement Number X-82435210 by HydroQual, Inc. under the partial sponsorship of the United States Environmental Protection Agency. Partial sponsorship was also provided by the New York State Energy Research and Development Authority, Albany, New York, and Rockland County Sewer District No. 1, Orangeburg, New York. This report covers a period from August 1998 to January 2001, and work was completed as of November 1999.

The demonstration project first entailed operation of a continuous deflection separation (CDS) unit to treat raw wastewaters, similar to sanitary sewer overflow (SSO) and combined sewer overflow (CSO) in solids characteristics. Two screens were evaluated, with 1200-micron and 600-micron apertures, substantially smaller than the CDS technology typically used (2400-micron) for floatables removal. Total suspended solids (TSS) removals averaged 10 and 30 percent for the two screen sizes, respectively. The smaller screen was observed to blind at its surfaces, while the 1200-micron retained the desired self-cleaning capability characteristic of this technology.

Other technologies were also tested at the same time with the CDS units. A fiber-based media, high-rate filter, the Fuzzy Filter, was operated downstream of the CDS unit. At loadings between 400 and 600 Lpm/m<sup>2</sup> (10 and 15 gpm/ft<sup>2</sup>), it was capable of achieving approximately 40 percent TSS removals. The process was found to effectively remove particles greater than 50-micron, which benefitted the performance of downstream UV disinfection processes.

Three different UV configurations were operated downstream of the CDS and Fuzzy Filter processes. One used low-pressure, high output lamps while the other two used medium pressure lamps. The medium pressure units comprised a closed-chamber and an open-channel unit. In addition to operating the pilot units, collimated-beam, dose-response testing was conducted on the primary-type wastewaters. The results of the study suggest that 2-log reductions can be consistently accomplished at doses on the order of 30 mJ/cm<sup>2</sup>, with minimal removal of particulates. These reductions can be increased to between 2.3 and 2.8 with removal of larger particles, greater than approximately 50-micron. These results are based on enumeration of blended samples. If the exposed samples are not blended, the apparent reductions will be between 2.5 and 3.5 logs.

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Preparation of this report was the responsibility of Karl Scheible of HydroQual, Inc. The field effort was conducted under the direction of HydroQual, and recognition is given to Edward Mignone, Michael Cushing and Francisco Cardona for their efforts. The project liaison for the Rockland County Sewer District No.1 was Martin Dolphin. The District's Executive Director is Ronald Delo. The Project Officer for the USEPA Office of Water was Bryan Rittenhouse; Thomas O'Connor of the USEPA Office of Research and Development was the Technical Advisor. The Project Officer for NYSERDA was Lawrence Pakenas.